i) in a first separation/purification stage,

a) digesting the cells containing nucleic acids, removing cell debris and thereafter subjecting the nucleic acids to anion exchange against an anion exchanger in a first buffer solution, which has a low ionic strength,

b) desorbing the nucleic acids from the anion exchanger by applying a second buffer solution, which has a higher ionic strength than the first buffer solution, effecting purified nucleic acids in the second buffer solution; and

H' (cont.)

ii) in a second separation/purification stage,

c) adsorbing the separation/purified nucleic acids in the second buffer solution onto the surface of a mineral support material, optionally in the presence of lower alcohols, poly(ethylene glycol), or a mixture thereof, and

d) desorbing the nucleic acids from the mineral support material by applying an eluant, wherein the eluant is water or a third buffer solution, which has an ionic strength lower than the second buffer solution, effecting twice-purified nucleic acids.

83. The process according to claim 82, wherein the stages i) and ii) are carried out in immediate succession.

84. The process according to claim 82, further comprising the step of, prior to the digesting step, subjecting the cells to centrifugation or filtration in order to remove undissolved components.

85. The process according to claim 82 further comprising, between the steps a) and b), one or more washing steps by applying a fourth buffer solution, which has a low ionic strength, optionally increasing ionic strength per washing step.

86. The process according to claim 82 further comprising, between the steps c) and d), one or more washing steps by applying a fifth buffer solution, which has an ionic strength higher than the first buffer solution.

87. The process according to claim 82 further comprising, between the steps c) and d), at least one washing step by applying an aqueous alcoholic solution.

88. The process according to claim 82 further comprising, between the steps c) and d), a washing step by applying a solution having an ionic strength corresponding to a 1.5 molar sodium perchlorate solution and a pH of 5.

89. The process according to claim 82, wherein the isolated and purified nucleic acid has from 10 nucleotides to 200,000 nucleotides.

90. The process according to claim 82, wherein the mineral support material is silica gel, glass, zeolite, aluminum oxide, titanium dioxide, zirconium dioxide, kaolin, or diatomacae.

91. The process according to claim 82, wherein the anion exchanger has a porous or non-porous matrix having a particle size of from 1 to 250 μm.

92. The process according to claim 82, wherein the anion exchanger has a porous or non-porous matrix having a particle size of from 10 to 30 μm.

93. The process according to claim 82, wherein, prior to the digesting step, the cells are subjected to centrifugation or filtration in order to remove undissolved components.

H' (cont.)

94. The process according to claim 82 further comprising, between the steps a) and b), one or more washing steps using a fourth buffer solution, which has a low ionic strength, optionally increasing ionic strength per washing step.

95. The process according to claim 82 further comprising, between the steps c) and d), one or more washing steps using a fifth buffer solution, which has an ionic strength higher than the first buffer solution.

96. The process according to claim 82 further comprising, between the steps c) and d), a washing step using a solution having an ionic strength corresponding to a 1.5 molar sodium perchlorate solution and a pH of 5.

97. The process according to claim 82, wherein the anion exchanger has a high surface charge.